

CHAPTER 6

BOAT SEAMANSHIP

LEARNING OBJECTIVES

Upon completing this chapter, you should be able to do the following:

1. Describe the boat davits used on MCM ships.
2. Describe the proper procedures for hoisting boats in and out of the water.
3. Explain how inflatable lifeboats operate and are maintained, and stowed.
4. Identify the flags in the flaghoist signaling system and explain how the system operates.
5. Describe the maritime buoyage systems and explain what each buoy means.
6. Describe the aids to navigation found in intercoastal waterways.
7. Describe the distress signals used by waterborne vessels.

INTRODUCTION

Every ship has on board some form of small boat that can be used for utility or emergency purposes. In this chapter, we discuss the boats carried on MCM ships. As part of that discussion, we also cover the flaghoist signaling system used to communicate between craft, and then discuss the aids to navigation used by both ships and boats.

NAVY BOATS

A Navy boat is an uncommissioned, waterborne unit of the fleet, not designated as a service craft, that is capable of limited independent operation. It may be assigned to and carried on a ship as a ship's boat or assigned to a shore station or fleet operating unit. The Navy boat on board MCM class ships is the rigid-hull inflatable boat (RIB).

Every Navy boat in active service must have a complete outfit of equipment. This equipment enables the boat, with its crew, to perform normal day-to-day functions and to weather minor emergencies. A copy the boat's outfit should be available to the boat coxswain. A good place to post the list is in the front of the boat log.

BOAT DAVITS

Basically, a davit is nothing more than a special crane designed for handling a boat in a safe and timely way.

The essential function of the davit arm is to swing the boat from its inboard position to a point outboard of the ship's side, from which the boat may be lowered; this process is reversed when the boat is hoisted. Hoisting operations are controlled by wire rope falls from which a hoisting hook is suspended.

SLEWING BOAT DAVIT

A slewing boat davit has a single arm mounted on a pedestal, which in turn is mounted to the ship. The arm rotates about the vertical axis of the pedestal to move the boat inboard and outboard. This electrically-powered boat davit design, commonly called a slewing arm davit (SLAD) (fig. 6-1), is used to handle rigid-hull inflatable boats (RIB) that are stowed on the deck of the ship next to the pedestal.

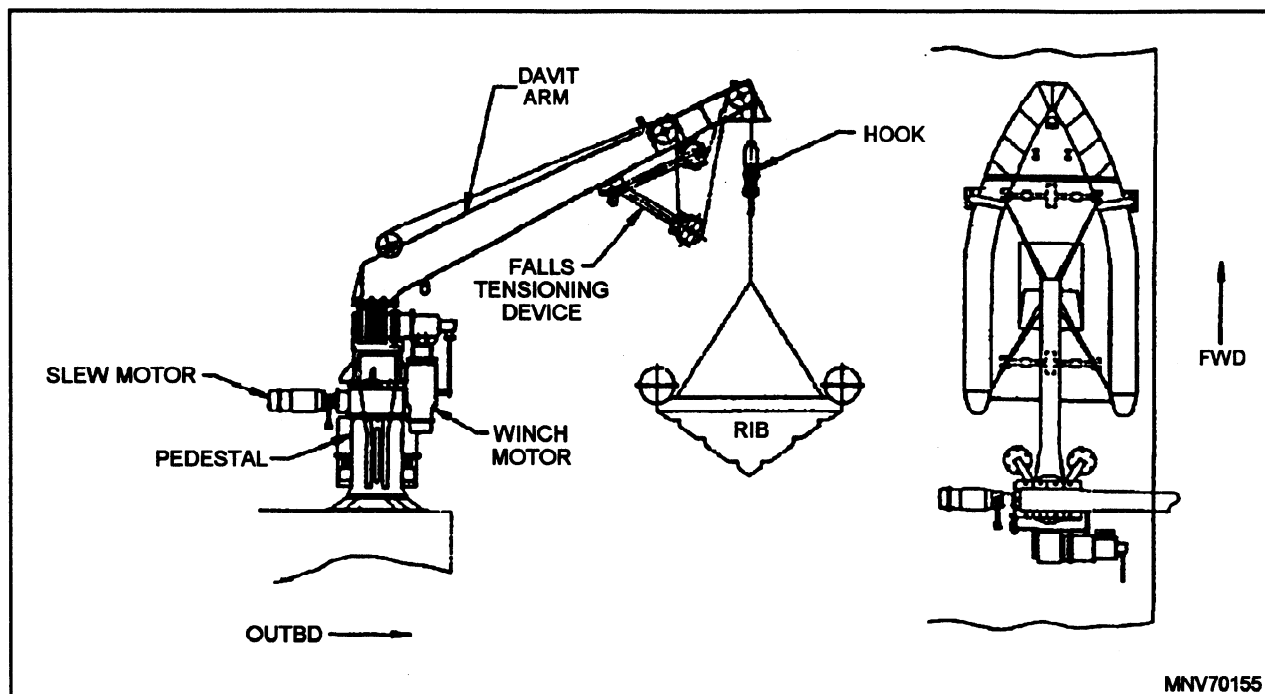


Figure 6-1.—Slewing arm davit (SLAD).

Standard Release Gear

On boat davits, the standard release gear used on the SLAD is the automatic release hook (fig.6-2).

Lowering Boats in Davits

The boat coxswain is responsible for making the boat ready and getting the crew into the boat. The

coxswain must make sure that all of the boat equipment is on hand. Everything must be rigged properly, and the fenders must be in place. The boat engineer checks the fuel and oil levels and tests the engine.

When the PO in charge of the lowering detail is satisfied that all is correct and the bridge gives permission to lower the boat, the operation can begin.

All personnel in the boat should wear an inherently buoyant life jacket and hard hat. In addition, they should keep a monkey line or life line in hand for safety during lowering and hoisting operations.

During lowering, the monkey lines should hang over and inboard, between the ship and the boat. This will prevent the lines from being fouled around an object or structure of the boat and will keep them clear of the boat once it is in the water.

When the boat is just clear of the water—that is, out enough that it is not slapped around by a wave—the lowering should be stopped and the engine started. This will give the boat maneuverability once it is waterborne. With the engine in operation, the boat can be lowered to the water.

Once the boat is waterborne, at the order “Cast off aft,” the after fall is released. At the order “Cast off forward,” the forward fall is released. The falls are pulled clear of the boat by the frapping lines. The boat is

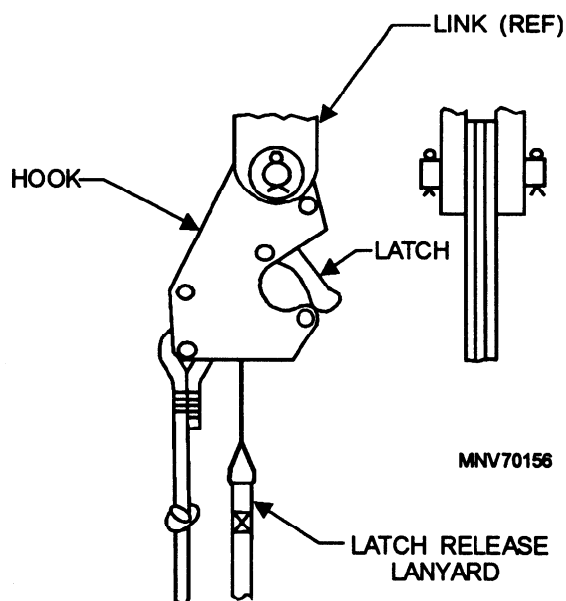


Figure 6-2.—Automatic releasing safety hook.

now riding to the sea painter (bow line), and the boat crew will cast off first the after and then the forward steadying lines. When the boat gains headway, they cast off the sea painter and the boat is free.

Hoisting Boats by Davits

The procedure for hoisting a boat by davits is the reverse of the lowering operation. The personnel on deck should have everything ready in advance. The davits are swung out, and the boat falls and monkey lines are lowered and held to the ship by frapping lines. Fenders are rigged, and the handling equipment is energized and tested.

The ship should provide a lee for the approaching boat; that is, the ship should move ahead slowly in a direction to protect the boat from the sea and the wind.

As the boat comes alongside, the sea painter is passed to the boat and secured over the forward inboard cleat. As the boat rides back on the sea painter, the boat falls and monkey lines are eased out to the boat. The forward fall is secured first, then the after fall. When all is hooked up and secured, the crew on deck takes the slack out of the falls, hoists the boat aboard and secures it. Davits should be stopped at the weather deck to disembark the boat crew.

INFLATABLE LIFEBOATS

Experience from disasters and experiments conducted under different conditions have proven that personnel who abandon ship in water below 70°F must be kept entirely out of the water and protected from the elements if they are to survive.

Navy ships have inflatable lifeboats installed on board that not only keep surviving personnel out of the sea, but also have canopies to provide shelter from the elements. As with many safety items, we tend to accept

them as just another fixture installed on board. Unfortunately, improper installation and maintenance have accidentally launched some inflatable boats or, worse, made them useless when needed.

STANDARD ALLOWANCE

The standard shipboard allowance of inflatable lifeboats is whatever number will provide room for 100 percent of the ship's crew. The issue of inflatable lifeboats is determined and approved by NAVSEA.

TYPES OF INFLATABLE LIFEBOATS

The Navy has successfully used many types of rigid and inflatable lifeboats throughout the years. Today, Navy ships have either Mk 5 Mod 2, 15-person or Mk 6, 25-person encapsulated lifeboats on board. These lifeboats come packed in rigid fiber glass containers, with survival gear and rations packed inside the lifeboat. The containers are stowed in cradles or racks designed to accommodate them aboard ship.

CHARACTERISTICS OF INFLATABLE LIFEBOATS

The Mk 5 Mod 2 and Mk 6 inflatable lifeboats are designed for compact stowage aboard ship and for quick inflation if it becomes necessary to abandon ship. A few characteristics of these boats are shown in table 6-1. The lifeboats may be inflated by pulling on the sea painter (length, 100 ft), which extends through the opening at one end of the container. The sea painter is faked into a tube inside the carrying case; the entire length must be pulled out of the container to activate the inflation valves.

Each lifeboat has a double-layered canopy with boarding openings at each end. The openings are fitted with closures that may be closed as desired. An air

Table 6-1.—Characteristics of Inflatable Lifeboats

BOAT TYPE	CAPACITY	WEIGHT (lbs)	DIMENSIONS-INFLATED		DIMENSIONS-CASE/CONTAINER		
			L	W	H	W	L
Mk 5 Mod 2	15 persons	450	15'81"	7'4"	27"	dia	56"
					Rigid Container		
Mk 6	25 persons	515	17'9-3/4"	8'10-1/21"	27"	dia	56"
					Rigid Container		

space (about 3 1/2 inches) between the two layers of canopy fabric provides insulation against extremes of heat and cold.

A raincatcher tube for collecting rainwater is installed in the top of the canopy, near the center of the lifeboat. The lower end can be tied off to allow water to accumulate in it. Two plastic bags for collecting and storing water are provided in the survival equipment.

Life lines are provided around the inner and outer circumference of the boat. The outside line is intended to be an aid to boarding; the inside line is for survivors to use for support during heavy weather.

A righting line, knotted at 12-inch intervals, is attached to the bottom of the raft and can be used to right the lifeboat should it inflate upside down or be capsized from wave and wind action.

Rope ladders, located at each end of the lifeboat, are used for boarding.

LAUNCHING PROCEDURES

The Mk 5 Mod 2 and Mk 6 boats can be launched in either of two ways. They can be manually placed overboard or, if they are left on a sinking ship, they will automatically launch themselves.

Automatic Launching

If the ship should sink before the boats can be launched manually, the boats will sink with the ship to a depth of between 10 and 40 feet. At some point within these depths, water pressure will automatically activate the hydrostatic release, allowing the boats to float to the surface. For boats stowed in rigid containers, one end of the sea painter is attached to the cylinder valve actuating cables. The other end is attached to the lifeboat stowage point. As the ship continues down, the painter will pay out to its full length, creating a pulling force on the cylinder valve activating cables, releasing the compressed air into the boat and inflating it automatically. The painter has a predetermined breaking strength, less than the buoyancy of the boat, that allows it to break once the lifeboat has surfaced.

Manual Release Launch

If an abandon ship situation occurs and there is sufficient time to release the boats, you can trip the hydrostatic release manually by hitting its release button with the heel of your hand. After you clear away the stowage straps, push or roll the boat overboard.

Then pull the painter, actuating the cylinder valves and inflating the boat.

NOTE

The survival gear for boats packed in rigid containers is packed in the lifeboat, where it is immediately available when the lifeboat is inflated.

Inflation

The boat has the latest in improved inflation systems. The compressed air cylinder, under high pressure, ensures rapid (20 to 30 seconds) inflation at temperatures as low as -20°F. At high ambient temperatures, the compressed air system creates a somewhat higher than normal pressure in the hull tubes. This pressure is relieved by the pressure relief valves installed in each of the tube compartments. These valves will relieve at 3.5 psi and close automatically at 2.6 psi.

The boat, after initial inflation, will be quite firm. Cooler air temperatures will cause the boat tubes to soften. This is normal. As the sun causes the temperatures to rise during the day, the heat causes the tubes to firm up again. Use the hand pumps packed in the boat to "top off" the boat to normal pressure when required.

Inflate the inflatable floors and cross tubes by means of the hand pumps as soon as possible after you board the lifeboat, as they provide insulation against the colder water temperature.

Stowage

The standard Navy lifeboat container is stowed on a cradle that has a H-degree lip on its outboard side. (See fig. 6-3.) The purpose of this lip is to prevent the lifeboat from falling out of its cradle if the hydrostatic release is accidentally tripped

Securing Harness

The lifeboat is held securely in its stowage by three assemblies in one. These are (1) a hydrostatic release mechanism, (2) a plastic-coated wire-rope harness, and a (3) a 1/4-inch-diameter double braided nylon cord. The 1/4-inch nylon cord is provided as an emergency means of launching the lifeboat in case the hydrostatic release device is frozen or inoperative. No substitution for the nylon cord is authorized. It is attached to the shackle on the hydrostatic release device by a bowline.

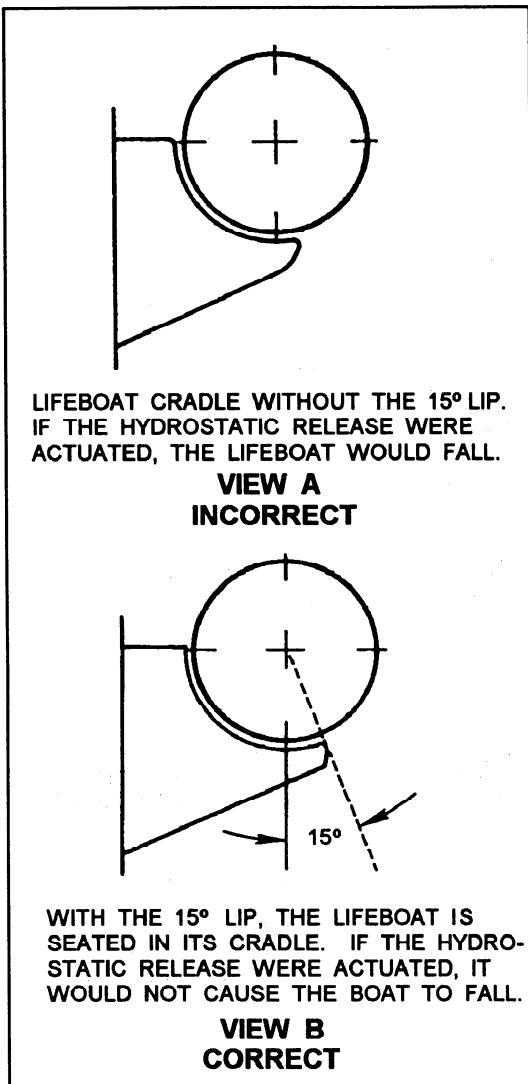


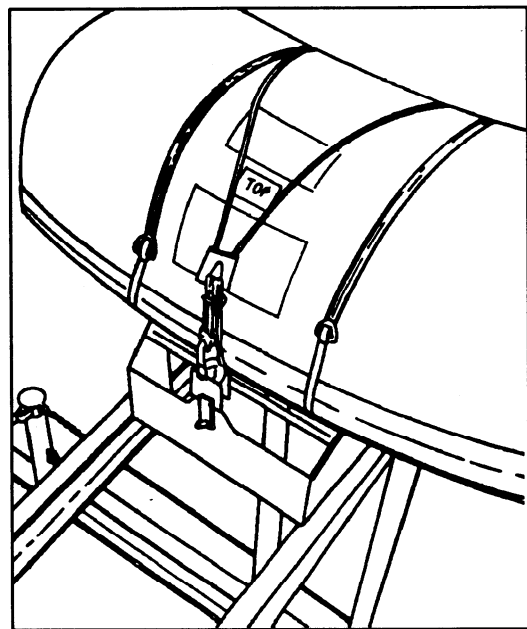
Figure 6-3.—15-degree lip on cradle.

The bitter end is passed through the thimble of the wire-rope harness, then back through the shackle five turns, and secured with a clove hitch and two half hitches. In an emergency, if the gear fails to work as designed, the nylon cord can be cut easily with a knife. Figure 6-4 shows a properly secured lifeboat.

Painter Line

The painter line for automatic launching of encapsulated lifeboats is 100 feet long and is faked inside the container to actuate the air inflation bottles. If you are directed to secure the painter line to the ship, use the following five-step procedure:

1. Remove the painter cork from the lifeboat container grommet.



THIS LIFEBOAT IS PROPERLY SECURED WITH THE 1/4 - INCH NYLON CORD INSTALLED.

Figure 6-4.—Properly secured lifeboat.

2. Determine the length required for the painter to reach from the lifeboat to where it will be fastened to the ship's structure.

3. Tie an overhand knot in the painter line at the point determined above and immediately on the inside of the container next to the cork. (See fig. 6-5.)

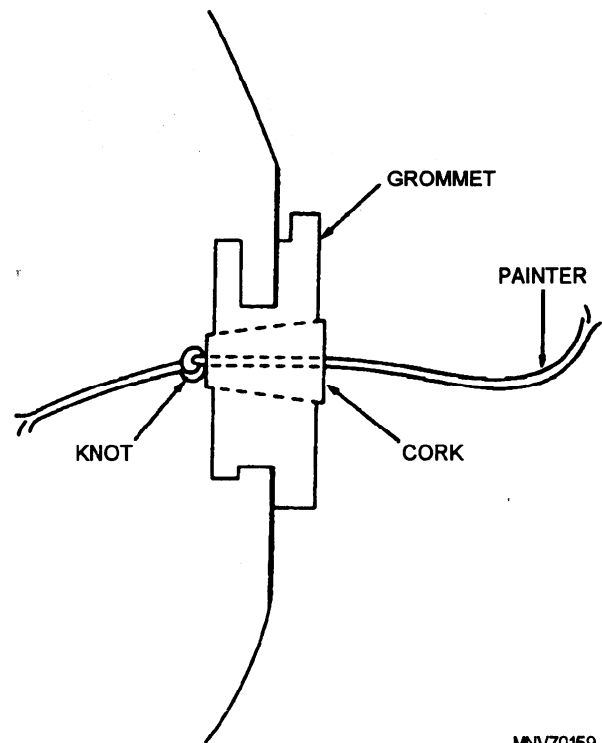
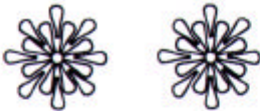


















Figure 6-5.—Container grommet (Mk 5 Mod 2 and Mk 6).

SHIP-TO-BOAT SIGNALS			MEANING
FLAG OR BLINKER	PYROTECHNIC FLARE		
			STEADY ON PRESENT COURSE.
 (EIGHT)			STEER STRAIGHT AWAY FROM THE SHIP.
 (EIGHT)	 (PORT)		STEER LEFT. WHEN HAULED DOWN, CEASE TURN AND STEADY ON PRESENT COURSE.
 (EIGHT)	 (STARBOARD)		STEER RIGHT. WHEN HAULED DOWN, CEASE TURN AND STEADY ON PRESENT COURSE.
 (EIGHT)	 (SCREEN)		STEER STRAIGHT TOWARD THE SHIP.
 (QUEBEC)			RETURN TO THE SHIP.
BOAT-TO-SHIP SIGNALS			
			CANNOT FIND THE MAN.
BLINKER OR SEMAPHORE			HAVE RECOVERED THE MAN.
			NEED ASSISTANCE.

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Figure 6-6.—Man overboard/pilot rescue signals.

4. Reinstall the cork securely into the grommet.
5. Fasten the painter securely to the ship's structure at a point accessible to the person launching the lifeboat.

LIFEBOATS AND SIGNALS

JCS Pub 2, *Unified Action Armed Forces* requires that a ship at sea have at least one boat rigged and ready for use as a lifeboat. Your ship's boat bill will specify the exact condition of the lifeboat and the items of equipment that must be in it. On MCM class ships, the rigid-hull inflatable boat is used as the lifeboat.

At the beginning of each watch, the lifeboat coxswain will muster the crew, check the boat and gear, have the engine tested, and report to the officer of the deck.

Every crew member must know lifeboat recovery procedures, in case someone goes overboard. Quick recovery is particularly important in cold water, in which a victim can live only a few minutes.

Once a lifeboat is in the water, it will be directed to the victim, but the victim's position relative to the ship will probably have changed before the lifeboat gets there. To help direct the boat to the victim, a simple system of signals is used.

During the day, directions are given by flags hoisted where they can be seen best; at night, directions are given by flashing light or pyrotechnics. Figure 6-6 shows the flaghoist, flashing light, and pyrotechnic signals and their meanings. At night, pyrotechnics fired by the Mk 5 pyrotechnic pistol may also be used to direct the boat.

The boat should approach from downwind, to keep from being blown over the victim. The last part of the approach should be made with the engine stopped, with the recovery attempt made at the bow. If possible, the coxswain should try to avoid having the screw turning in the vicinity of the victim.

FLAGHOIST SIGNALING

Flaghoist signaling provides a rapid and accurate system for sending maneuvering and information signals of reasonable length, during daylight, between ships within sight of each other. Of all visual signals, a flaghoist signal tends to ensure the most uniform execution of a maneuver.

For signaling by flaghoist, the Navy uses the international alphabet flags and numeral pennants and,

in addition, a set of numeral and special meaning flags and pennants.

PARTS OF A FLAG

Figure 6-7 shows the various types of flags and their parts.

- The FLY is the length of the flag, measured from the staff to the flag's outside edge.
- The HOIST is the vertical width of the flag when it is flying free.
- The TABLING is the double thickness of bunting-taped, bound, and stitched-at the staff side of a flag.
- The TAIL LINE, carrying the snap hook, is a short length of halyard attached to the lower part of the tabling. It serves as a spacer, separating the flags of a hoist to make reading the signals easier.
- The RING is attached to the top of the tabling and snaps into the tail line of the preceding flag or hook of the halyard.
- The TACKLINE is a 6-foot length of braided signal halyard with a ring at one end and a snap hook at the other. The tackline is used to separate signals or groups of numerals that if not

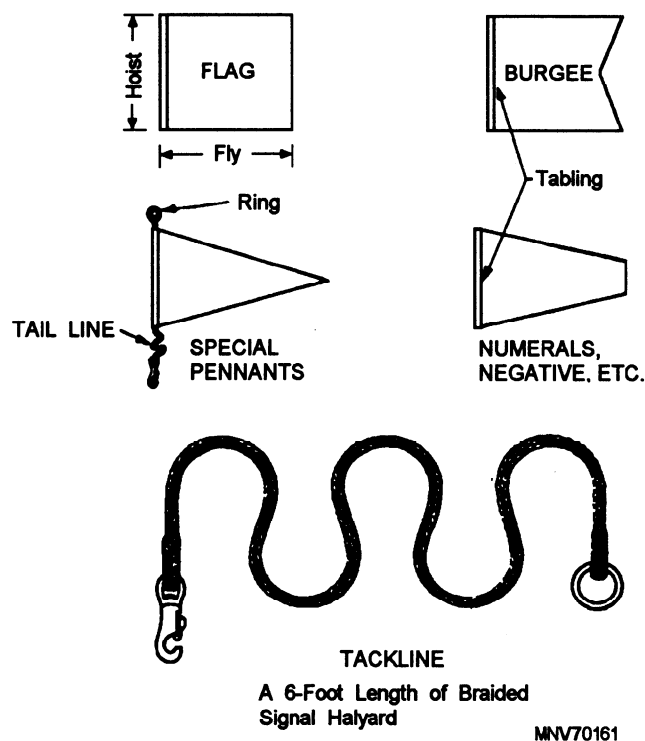


Figure 6-7.—Parts of a flag.

separated could convey a meaning different from the intended meaning.

HOW TO READ FLAGHOISTS

The flags of a hoist are always read from the top down. When a signal is too long to fit on one halyard—when, in other words, it requires more flags than can be made into a single hoist—the signal must be continued on another halyard. When a signal is broken into two or more hoists, it must be divided at points where there can be a natural space without affecting the meaning of the signal.

A complete signal or group of signals—whether on one hoist or on two or more adjacent hoists flying at the *same* time—is called a *display*. When displays of more than one hoist are raised, the separate hoists are run up, one by one, in the correct order. Do not try to run them up simultaneously.

As a general rule, a signal too long to be shown completely on three halyards is made into two or more displays. When two or more displays are used, the heading must be hoisted on a separate halyard and kept flying while successive displays are made.

When two or more hoists are flying, they are read from outboard in or from forward to aft. Figure 6-8 shows how to read a three-hoist display from the top down and from outboard in.

Flags may also be hoisted at the triatic stay. This is a line extending from the foremast to a stack or another mast. Such signals are read from forward to aft. A triatic stay is shown in figure 6-9. This illustration also shows hoists at two positions on a yardarm.

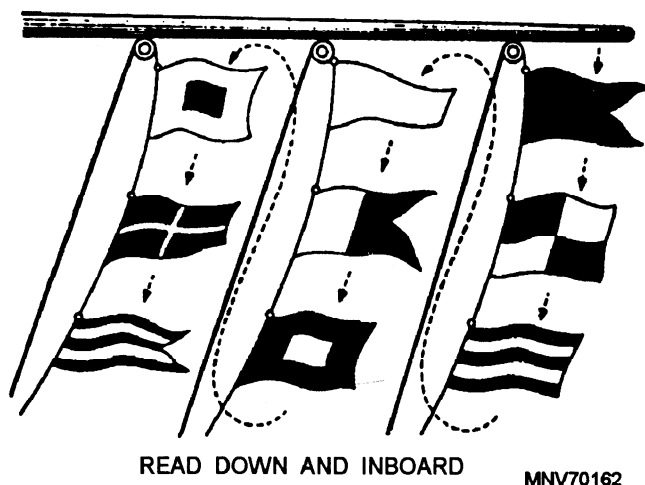


Figure 6-8.—Reading flaghoists

Signals hoisted at yardarms of different heights are read beginning at the highest yardarm. When several hoists are displayed simultaneously from different points, they are read in the following order: (1) masthead, (2) triatic stay, (3) starboard yardarm, and (4) port yardarm.

Terms used to describe the status of flaghoists are as follows:

- **Close-up:** A hoist is *close-up* when its top is touching the block at the point of hoist—that is, when the hoist is up as far as it will go.
- **At the dip:** A hoist is *at the dip* (or dipped) when it is hoisted three-fourths of the way up toward the point of hoist.
- **Hauled down:** A hoist is *hauled down* when it is returned to the deck.
- **Superior position:** Any hoist or portion of a hoist that is to be read before another hoist or portion of a hoist is said to be in a *superior position*.

FLAGS AND PENNANTS

Since flaghoist signaling is such a common method of sending signals, you must learn all of the flags and pennants well enough to recognize any one of them. (See figs. 6-10 and 6-11.)

Memory aids are a big help in learning the flags. For example: CHARLIE, TANGO, and WHISKEY are the only flags that are *red*, *white*, and *blue*. You could also think of them as WTC—watertight compartment.

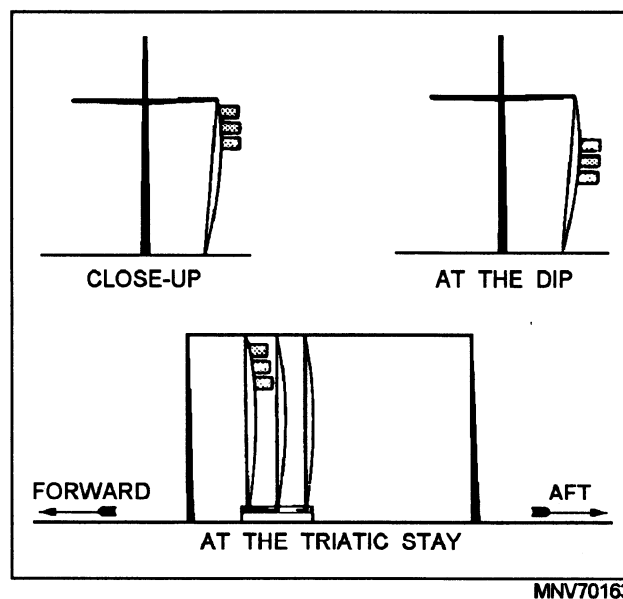


Figure 6-9.—Flaghoist positions.

FLAG and NAME	Spoken	Written	FLAG and NAME	Spoken	Written	FLAG and NAME	Spoken	Written
 A	ALFA	A	 M	MIKE	M	 Y	YANKEE	Y
 B	BRAVO	B	 N	NOVEMBER	N	 Z	ZULU	Z
 C	CHARLIE	C	 O	OSCAR	O	 1	ONE	1
 D	DELTA	D	 P	PAPA	P	 2	TWO	2
 E	ECHO	E	 Q	QUEBEC	Q	 3	THREE	3
 F	FOXTROT	F	 R	ROMEO	R	 4	FOUR	4
 G	GOLF	G	 S	SIERRA	S	 5	FIVE	5
 H	HOTEL	H	 T	TANGO	T	 6	SIX	6
 I	INDIA	I	 U	UNIFORM	U	 7	SEVEN	7
 J	JULIETT	J	 V	VICTOR	V	 8	EIGHT	8
 K	KILO	K	 W	WHISKEY	W	 9	NINE	9
 L	LIMA	L	 X	XRAY	X	 0	ZERO	0

Figure 6-10.—Alphabet and numeral flags.

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PENNANT and NAME	Spoken	Written	PENNANT or FLAG	Spoken	Written	PENNANT or FLAG	Spoken	Written
 1	PENNANT ONE	p1	 CODE or ANSWER	CODE or ANSWER	CODE or ANS	 NEGATIVE	NEGAT	NEGAT
 2	PENNANT TWO	p2	 SCREEN	SCREEN	SCREEN	 PREPARATIVE	PREP	PREP
 3	PENNANT THREE	p3	 CORPEN	CORPEN	CORPEN	 PORT	PORT	PORT
 4	PENNANT FOUR	p4	 DESIG- NATION	DESIG	DESIG	 SPEED	SPEED	SPEED
 5	PENNANT FIVE	p5	 DIVISION	DIV	DIV	 SQUADRON	SQUAD	SQUAD
 6	PENNANT SIX	p6	 EMERGENCY	EMERGENCY	EMERG	 STARBOARD	STARBOARD	STBD
 7	PENNANT SEVEN	p7	 FLOTILLA	FLOT	FLOT	 STATION	STATION	STATION
 8	PENNANT EIGHT	p8	 FORMATION	FORMATION	FORM	 SUBDIVISION	SUBDIV	SUBDIV
 9	PENNANT NINE	p9	 INTER- ROGATIVE	INTER- ROGATIVE	INT	 TURN	TURN	TURN
 0	PENNANT ZERO	p0						
TACK LINE	TACK	—						

SUBSTITUTES					
 1st. SUBSTITUTE	FIRST SUB	1st.	 3rd. SUBSTITUTE	THIRD SUB	3rd.
 2nd. SUBSTITUTE	SECOND SUB	2nd.	 4th. SUBSTITUTE	FOURTH SUB	4th.

Figure 6-11.—Numeral pennants; special flags and pennants.

THIS PAGE MUST BE PRINTED ON A COLOR PRINTER.

CHARLIE has horizontal stripes—a berthing compartment has tiers of horizontal bunks. Anything watertight is completely enclosed—the blue square of WHISKEY completely encloses the white square, which completely encloses the red square. That leaves TANGO, the flag with the vertical stripes. You could also remember TANGO as being similar to the flag of France (the stripes are in reverse order). You can make up any number of such things to jog your memory. They do not have to be logical. Often, the more exaggerated or silly they are, the easier they are to remember. Here’s an example: “Gee, what a lot of stripes,” for GOLF.

The numbered flags are easy. From 1 through 9, the basic colors, red, yellow, and blue, are repeated in that order. The first three have horizontal stripes, the next three have diagonal stripes, and 7, 8, and 9 have vertical stripes. Take one good look at zero. You are not apt to forget it.

Numeral flags are used along with alphabet flags and special pennants in flag signals, but numeral pennants are used only in call signs. The special flags and pennants are used in tactical maneuvers to direct changes in position, speed, formation, and course; to indicate units; and to designate specific units.

SUBSTITUTES

Substitutes are used to prevent alphabet flags, numeral flags, or numeral pennants from appearing more than once in the same hoist. They are what their name implies—substitutes for other flags or pennants already used in the hoist.

- FIRST SUBSTITUTE repeats the first flag or pennant in the hoist.
- SECOND SUBSTITUTE repeats the second flag or pennant in the hoist.
- THIRD SUBSTITUTE repeats the third flag or pennant in the hoist.
- FOURTH SUBSTITUTE repeats the fourth flag or pennant in the hoist.

If you wanted to send the signal CHARLIE BRAVO BRAVO CHARLIE, it would read from the top down:

CHARLIE

BRAVO

SECOND SUBSTITUTE

FIRST SUBSTITUTE

The FIRST SUBSTITUTE has repeated the first flag in the hoist, and the SECOND SUBSTITUTE has repeated the second flag in the hoist.

Substitutes are not used to repeat other substitutes, but they can repeat the flag that a substitute represents. The tackline is not repeated. Therefore, when you count to determine which flag the substitute represents, do not include the tackline in the count.

Substitutes are also used as absentee pennants when a ship is not under way. They are flown from sunrise to sunset on the yardarms of the mainmast and indicate the absence of embarked officers and officials for less than 72 hours.

The FIRST SUBSTITUTE flown outboard at the starboard yardarm indicates the absence of the flag officer or unit commander whose flag or pennant is flying on the ship.

The SECOND SUBSTITUTE is the chief of staff’s absentee pennant and is flown inboard at the port yardarm. When displayed with the THIRD SUBSTITUTE, it must be inboard.

The THIRD SUBSTITUTE is the captain’s absentee pennant. It is flown outboard from the port yardarm. If the captain is absent over 72 hours, this pennant indicates the absence of the executive officer.

The FOURTH SUBSTITUTE indicates the absence of the civil or military official whose flag is flying on the ship. It flies from the inboard starboard yardarm. When displayed with the first substitute, it must be inboard.

NOTE

In the absence of a commanding officer who is acting as a temporary unit commander, both absentee pennants are displayed.

SINGLE FLAGS

Many one-flag signals are used in the Navy. Small vessels, which do not maintain a constant signal watch while in port, frequently rely on the Petty Officer of the Watch to recognize some of these signals or to rouse out a QM or SM when needed. Of course, INDIA flying at the dip on an approaching vessel requires breaking out deckhands, not a Signalman, because INDIA shows that the ship is coming alongside. Every sailor should know at least the few signals listed here. (Except where noted, these signals are flown where best seen.)

- **ALFA:** Divers or underwater demolition personnel are down. If a numeral group follows ALFA, the numbers indicate in hundreds of yards the radius within which the personnel are working.
- **BRAVO:** The BRAVO flag is hoisted whenever vessels are transferring fuel or explosives. During gunnery practice, it is flown on the appropriate side. It is also required in a boat (in the bow or where best seen) transporting fuel or explosives. While BRAVO flies, the smoking lamp is out.
- **INDIA:** In port, INDIA at the dip on an approaching ship indicates that it is preparing to come alongside. When the flag is hauled close up, it is ready to come alongside. INDIA is displayed on the side that the evolution is to take place. The receiving ship also flies INDIA on the appropriate side, at the dip to show it is making preparations, and close up to show it is ready to receive the approaching vessel. When the first line is secured, INDIA is hauled down on both ships. At sea, ROMEO serves as this signal.
- **JULIETT:** Your ship's call followed by JULIETT displayed on another ship indicates that the other ship has a semaphore message for your ship. JULIETT followed by DESIG indicates a priority message. The hoist remains flying during transmission and is hauled down when the message has been sent.
- **MIKE:** The ship having medical guard duty flies MIKE.
- **OSCAR:** OSCAR indicates man overboard and is made up ready to break.
- **PAPA:** PAPA calls all personnel attached to that ship to return to the ship.
- **QUEBEC:** QUEBEC is the boat recall. When flying alone, it orders all boats to return immediately. QUEBEC plus one or more numeral pennants recalls the boat addressed.
- **ROMEO:** In port, ROMEO is flown by the ship having the ready duty. At sea, it is flown by ships preparing for and ready for replenishing. It is hauled down when the fast messenger is in hand (alongside method) or when the hose is in hand (astern method).
- **SIERRA:** SIERRA is flown while a ship is holding signal drill.
- **YANKEE:** In port, YANKEE is flown by the ship with the visual communications duty.
- **EIGHT flag:** The EIGHT flag is used when a boat is being directed by a ship during man overboard. The EIGHT flag hoisted alone means steer straight away from the ship. The EIGHT flag hoisted with the port or starboard flag means steer to the left (or right). The EIGHT flag hoisted with SCREEN (BLACK PENNANT) means steer straight to the ship.
- **FIVE flag:** The FIVE flag is the breakdown flag and is usually carried at the foretruck and made up ready to break. Every sailor should be able to recognize and know the meaning of the FIVE flag and the OSCAR. Both flags are always carried ready to break.

You will need practice if you are to remember the flags and pennants. Probably the best time to practice reading hoists is during slack periods while standing watches. During these periods, there usually will be a Signaller nearby who can check you. You will soon become quite proficient at reading flags and will learn the meanings of many maneuvering and other signals.

UNITED STATES STORM-WARNING SIGNALS

The combinations of flags and pennants shown in figure 6-12 are hoisted at the National Weather Service and other shore stations in the United States to indicate existing or predicted unfavorable winds. The meanings of the various displays are as follows:

- **Small-craft warning:** One red pennant displayed by day or a red light over a white light at night indicates that winds up to 38 miles an hour (33 knots) and/or sea conditions dangerous to small-craft operations are forecast for the area.
- **Gale warning:** Two red pennants displayed by day or a white light above a red light at night indicates that winds ranging from 39 to 54 miles an hour (34 to 47 knots) are forecast for the area.
- **Storm warning:** A single red flag with a black square center displayed by day or two red lights at night indicates that winds 55 miles an hour (48 knots) or above are forecast for the area. If the winds are associated with a tropical cyclone

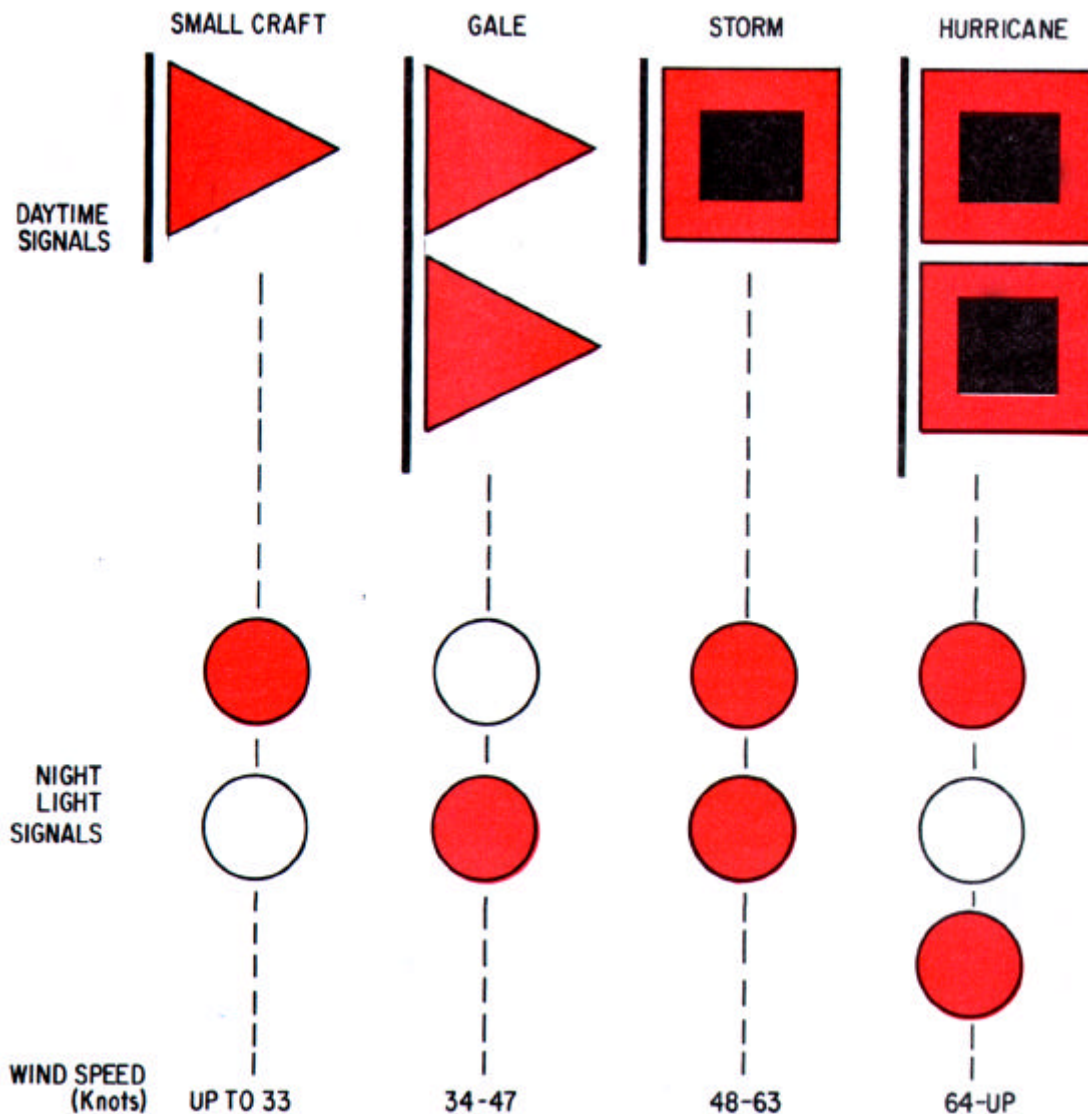


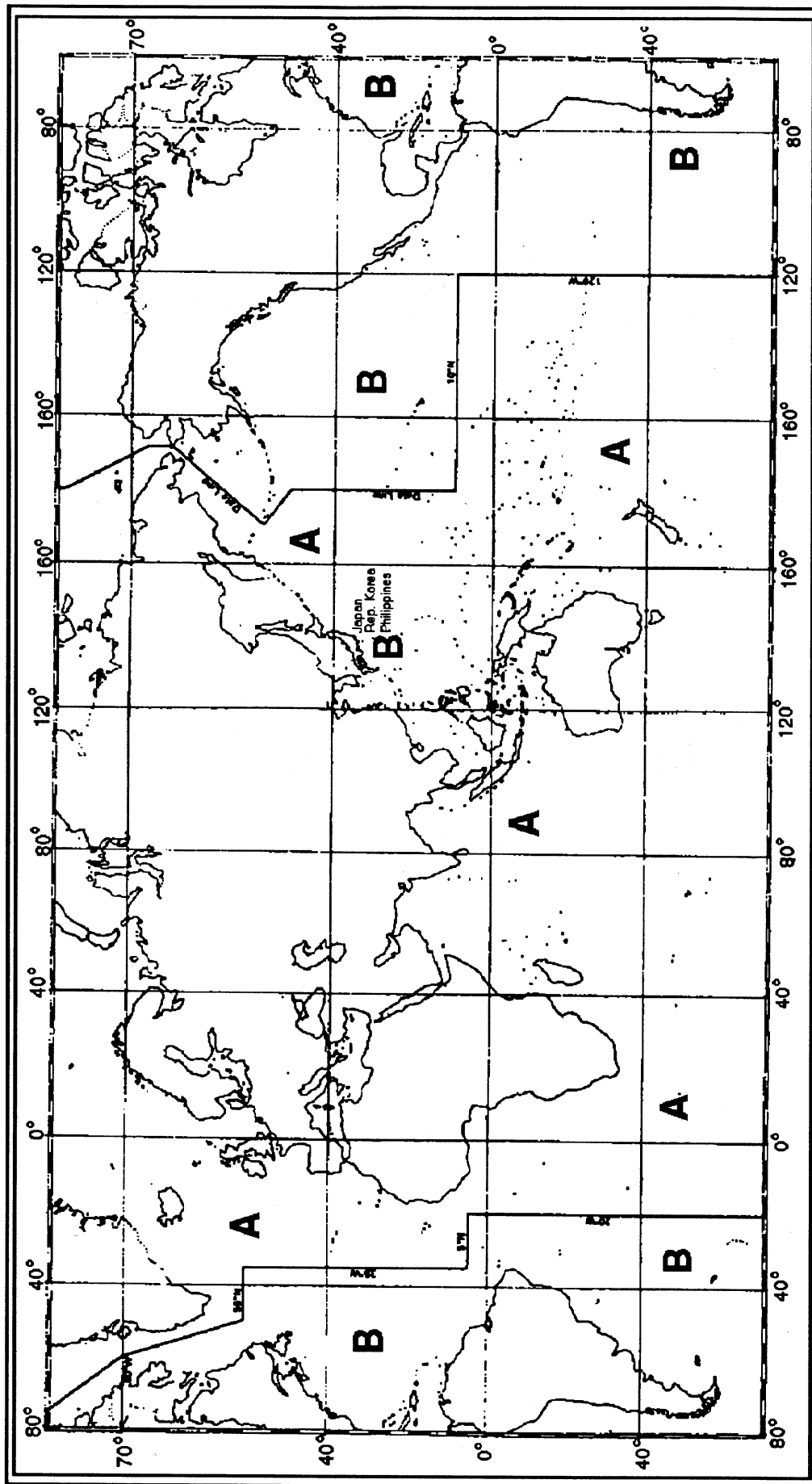
Figure 6-12.—Small-craft, gale, storm, and hurricane warnings.

(tropical storm), the storm-warning display indicates that winds ranging from 55 to 73 miles an hour (48 to 63 knots) are forecast.

- Hurricane warning: Two red flags with black square centers displayed by day or a white light between two red lights at night indicates that winds of 74 miles an hour (64 knots) or above are forecast for the area.

MARITIME BUOYAGE SYSTEM

A buoyage system is a collection of buoys (floating markers) placed to guide ships in and out of channels, to warn them away from hidden dangers, and to lead them to anchorage areas. Before 1982, as many as 30 different buoyage systems were in use around the world. In 1982 an agreement was signed by all maritime countries, establishing two international buoyage regions and condensing all buoyage into one



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Figure 6-13.—IALA Maritime Buoyage System, buoyage regions A and B.

system. (See fig. 6-13.) This agreement was sponsored by the International Association of Lighthouse Authorities (IALA) and bears its name.

The IALA Maritime Buoyage System provides rules that apply to all fixed and floating markers other than lighthouses, sector lights, range lights, lightships, and large automatic navigational buoys (lanbys).

BUOYS

Buoys have various sizes and shapes; however, they have distinctive coloring, shapes, and topmarks to indicate their purpose by day and colored lights with specific phase characteristics by night.

Although buoys are valuable aids to navigation, you must never depend on them exclusively. Buoys frequently drag their moorings in heavy weather or may be set adrift if run down by passing vessels. Lights on lighted buoys may go out of commission. Whistles, bells, and gongs actuated by the motion of the sea may fail to function in smooth water.

Buoy Shape

There are five basic buoy shapes (fig. 6-14); namely, *can*, *nun*, *spherical*, *pillar*, and *spat*. With the exception of pillar and spar buoys, the shape of the buoy indicates the correct side on which to pass. Can buoys may sometimes be referred to as cylindrical, and nun buoys may be referred to as *conical*. The term *pillar* is used to describe any buoy that is smaller than a lighthouse buoy and has a tall, central structure on a broad base. Lighted buoys in the United States are referred to as pillar buoys.

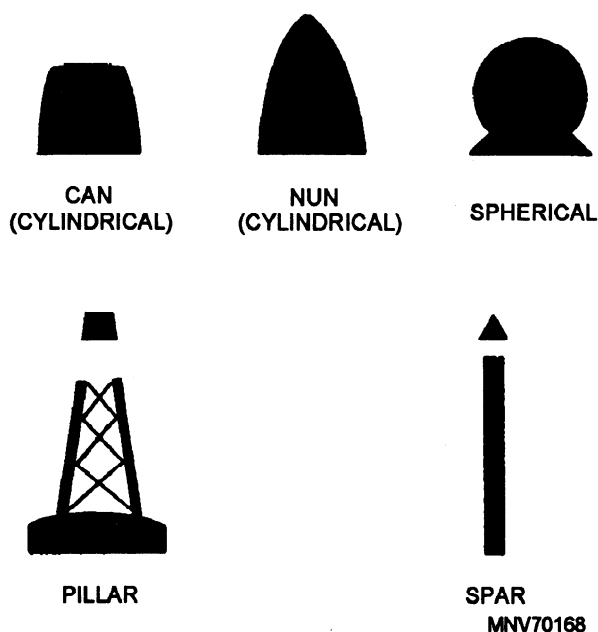


Figure 6-14.—Types of buoys.

Topmarks

Topmarks are small shapes placed on top of some lighted buoys to aid in daytime identification. The IALA Maritime Buoyage System uses can, nun, spherical, and X-shaped topmarks only. Topmarks on pillar and spar buoys are particularly important to indicate the side on which they will be passed and will be used, wherever practical.

Lights

Where marks are lighted, red and green lights are reserved for port and starboard or starboard and port lateral marks. Yellow lights are for special marks, and white lights are used for other types of marks, which we will discuss later in this chapter.

LATERAL MARKS

Lateral marks are generally used for well-defined channels. They indicate the route to be followed and are used in conjunction with a “conventional direction of buoyage.” This direction is defined in one of two ways:

- Local direction of buoyage—the direction the mariner should take when approaching a harbor, river estuary, or other waterway from seaward.
- General direction of buoyage—in other areas, a direction determined by the buoyage authorities, following a clockwise direction around continental landmasses, given in *Sailing Directions*, and, if necessary, indicated on charts by a symbol.

The numbering or lettering of buoys is an optional feature. In the United States, fairway and channel buoys are always numbered odd to port and even to starboard, approaching from seaward.

BUOYAGE REGIONS

As we mentioned previously, two International Buoyage Regions were established under IALA. Navigational charts produced and printed after 1983 indicate the buoyage region to which a chart refers.

Lateral Marks Used in Region A

As shown in figure 6-13, International Buoyage Region A covers Europe and Asia with the exception of Japan, the Republic of Korea, and the Republic of the Philippines. The major rule to remember in this region is “red to port” when you are returning from seaward.

Port hand marks for this area are shown in figure 6-15.

Color: Red

Shape (buoys): Can, pillar, or spar

Topmark (when required): Single red can

Light (when fitted)

Color: Red

Phase characteristics: Any except a composite group flashing (2 + 1)

Starboard hand marks for this area are shown in figure 6-16.

Color: Green

Shape (buoys): Nun, pillar, or spar

Topmark (when required): Single green cone, point upward

Light (when fitted)

Color: Green

Phase characteristics: Any except a composite group flashing (2 + 1)

When a vessel is proceeding in the “conventional direction of buoyage,” a preferred channel is indicated by a modified port or starboard lateral mark at the point where a channel divides.

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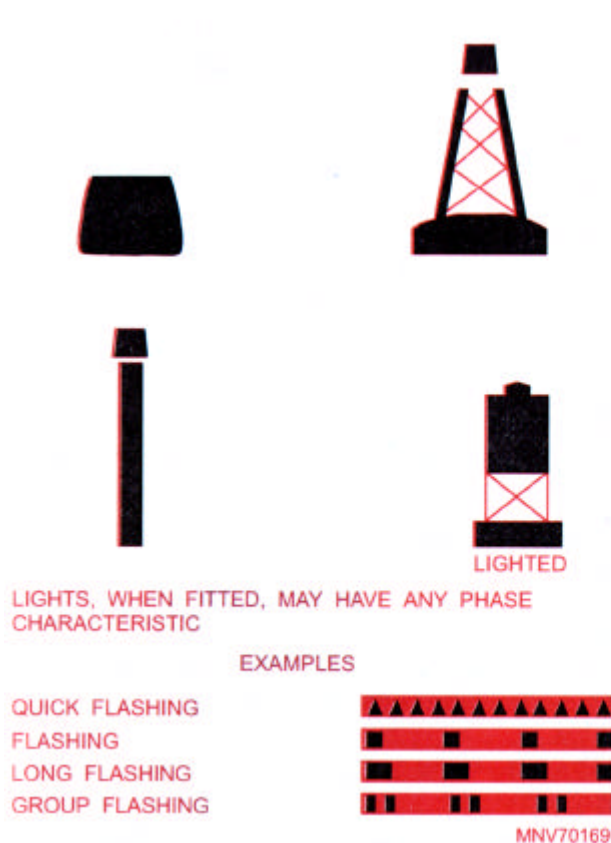


Figure 6-15.—IALA Maritime Buoyage System, International Buoyage Region A, port hand marks (buoys).

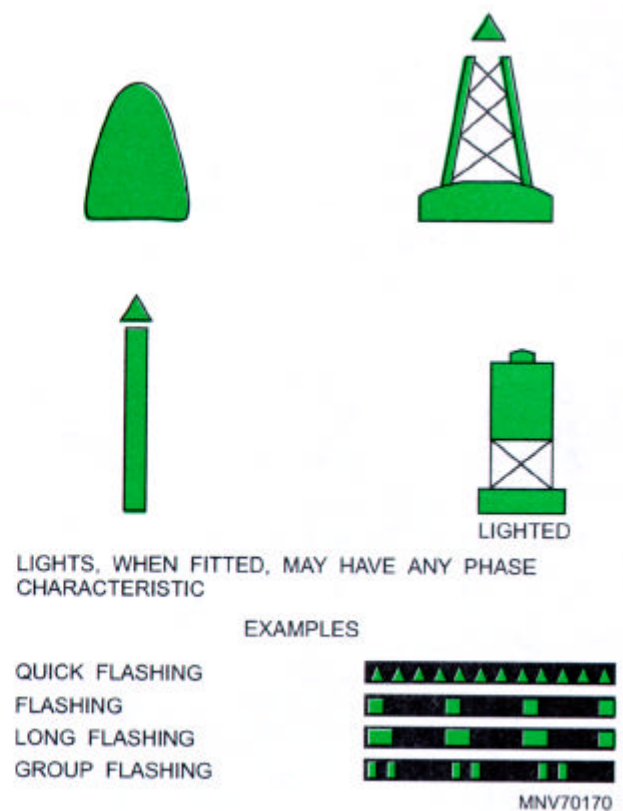


Figure 6-16.—IALA Maritime Buoyage System, International Buoyage Region A, starboard hand marks (buoys).

The preferred channel to port is indicated by the signals shown in figure 6-17.

Color: Green with one broad red horizontal band

Shape (buoys): Nun, pillar, or spar

Topmark (when required): Single green cone, point upward

Light (when fitted)

Color: Green

Phase characteristics: Composite group flashing (2 + 1)

The preferred channel to starboard is indicated by the signals shown in figure 6-18.

Color: Red with one broad green horizontal band

Shape (buoys): Can, pillar, or spar

Topmark (when required): Single red can

Light (when fitted)

Color: Red

Phase characteristics: Composite group flashing (2 + 1)

Lateral Marks Used in Region B

Basically, Region B covers the Western Hemisphere, Japan, the Republic of Korea, and the Philippines. The main rule to remember in this region is red right returning from seaward.

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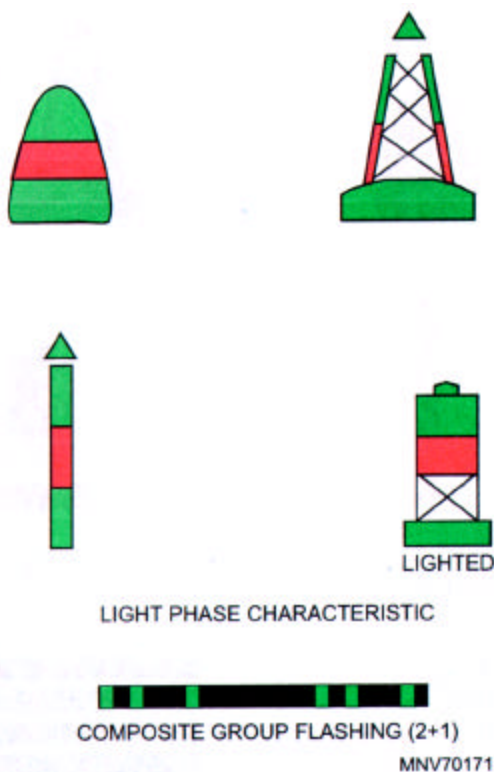


Figure 6-17.—IALA Maritime Buoyage System, International Buoyage Region A, preferred channel to port.

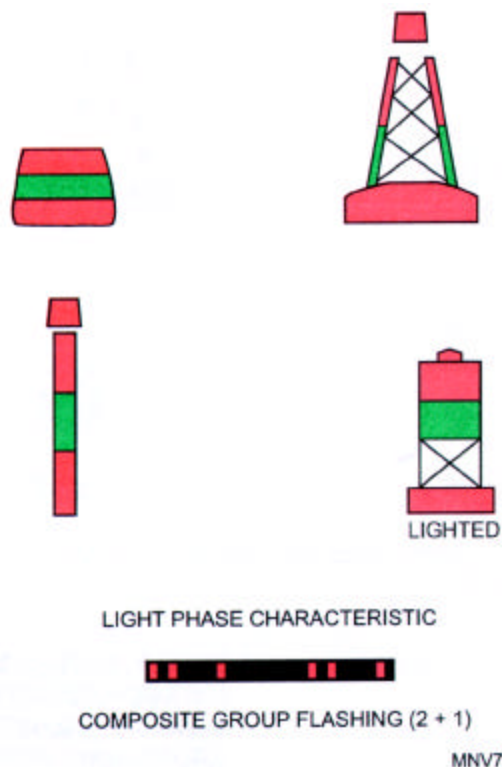


Figure 6-18.—IALA Maritime Buoyage System, International Buoyage Region A, preferred channel to starboard.

Port hand marks are shown in figure 6-19.

Color: Green

Shape (buoys): Can, pillar, or spar

Topmark (when required): Single green can

Light (when fitted)

Color: Green

Phase characteristics: Any except a composite group flashing (2 + 1)

Starboard hand marks are shown in figure 6-20.

Color: Red

Shape (buoys): Nun, pillar, or spar

Topmark (when required): Single red cone, point upward

Light (when fitted)

Color: Red

Phase characteristics: Any except a composite group flashing (2 + 1)

The preferred channel to port is indicated by the signals shown in figure 6-21.

Color: Red with one broad green horizontal band

Shape (buoys): Nun, pillar, or spar

Topmark (when required): Single red cone, point upward

Light (when fitted)

Color: Red

Phase characteristics: Composite group flashing (2 + 1)

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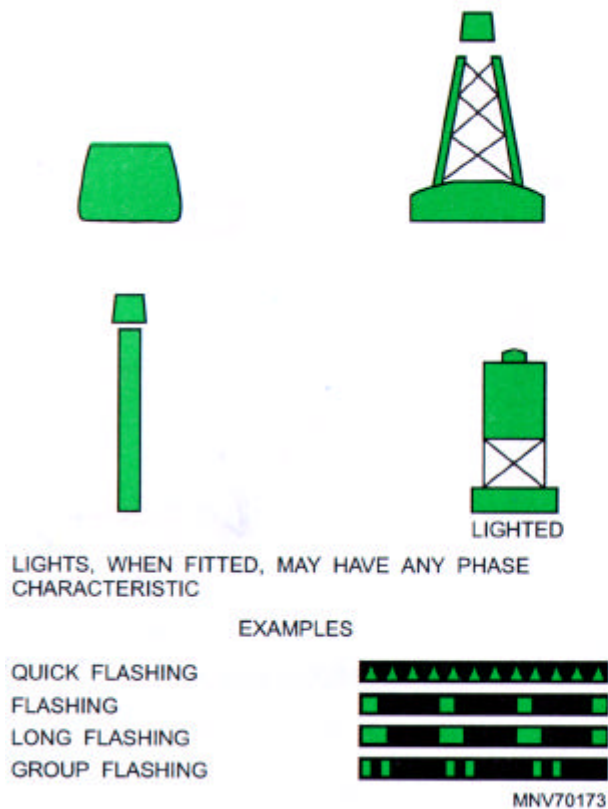


Figure 6-19.—IALA Maritime Buoyage System, International Buoyage Region B, port hand marks (buoys).

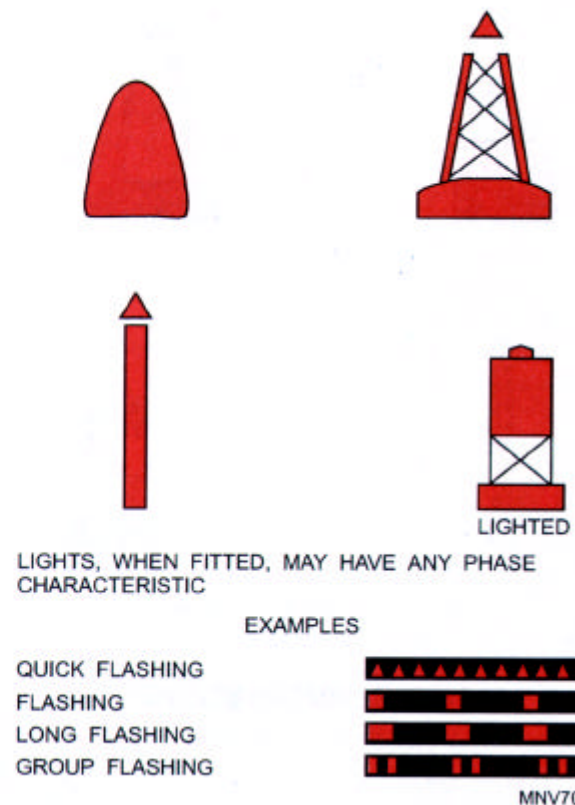


Figure 6-20.—IALA Maritime Buoyage System, International Buoyage Region B, starboard hand marks (buoys).

The preferred channel to starboard port is indicated by the signals shown in figure 6-22.

Color: Green with one broad red horizontal band

Shape (buoys): Can, pillar, or spar

Topmark (when required): Single green can

Light (when fitted)

Color: Green

Phase characteristics: Composite group flashing (2 + 1)

NOTE

In buoyage Regions A and B, if marks at the sides of a channel are numbered or lettered, the numbering or lettering will follow the “conventional direction of buoyage.”

CARDINAL MARKS

In some navigable bodies of water, the area having the best navigable water needs to be marked. Some of the reasons for marking the area are as follows:

- To indicate the deepest water in the area.
- To indicate the safe side on which to pass a danger.
- To draw attention to a feature in a channel, such as a bend, junction, branch, or end of a shoal.

Such an area is indicated by a cardinal mark, or buoy, that is placed in one of the four quadrants (north, east, south, or west) from the best water. A cardinal mark takes its name from the compass quadrant in

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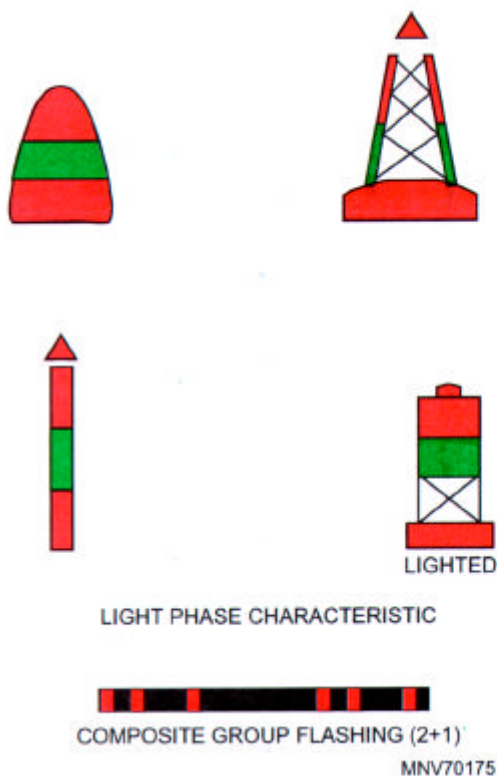


Figure 6-21.—IALA Maritime Buoyage System, International Buoyage Region B, preferred channel to port.

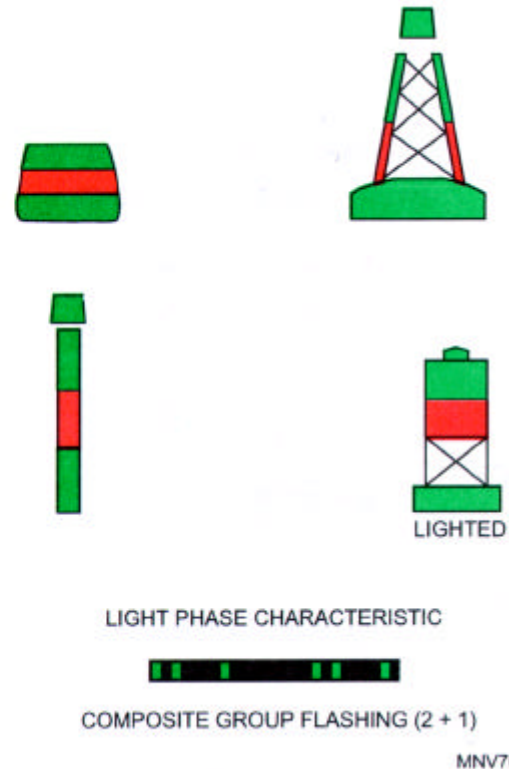


Figure 6-22.—IALA Maritime Buoyage System, International Buoyage Region B, preferred channel to starboard.

which it is placed. Figure 6-23 shows the four IALA Maritime Buoyage System cardinal marks, as related to a point of interest.

Notice that each quadrant shows the buoy or mark with its specific color coding, topmark, and light pattern. Basically, the figure tells you that you will be safe if you pass north of a north mark, east of an east mark, south of a south mark, and west of a west mark.

Topmarks

By day, topmarks are the most important features of cardinal marks. To interpret cardinal marks, you must know the arrangement of the cones. For north, the point of each cone is up. For south, the point of each cone is down. The west topmark resembles a wine glass.

Cardinal marks carry topmarks, whenever practical, with the cones as large as possible and clearly separated.

Color

Black and yellow horizontal bands are used to color cardinal marks. The position of the black band, or bands, is related to the points of the black topmarks. The black and yellow horizontal bands are used as follows:

- North—black band above yellow band
- South—black band below yellow band
- West—black band with yellow bands above and below
- East—black band above and below yellow band

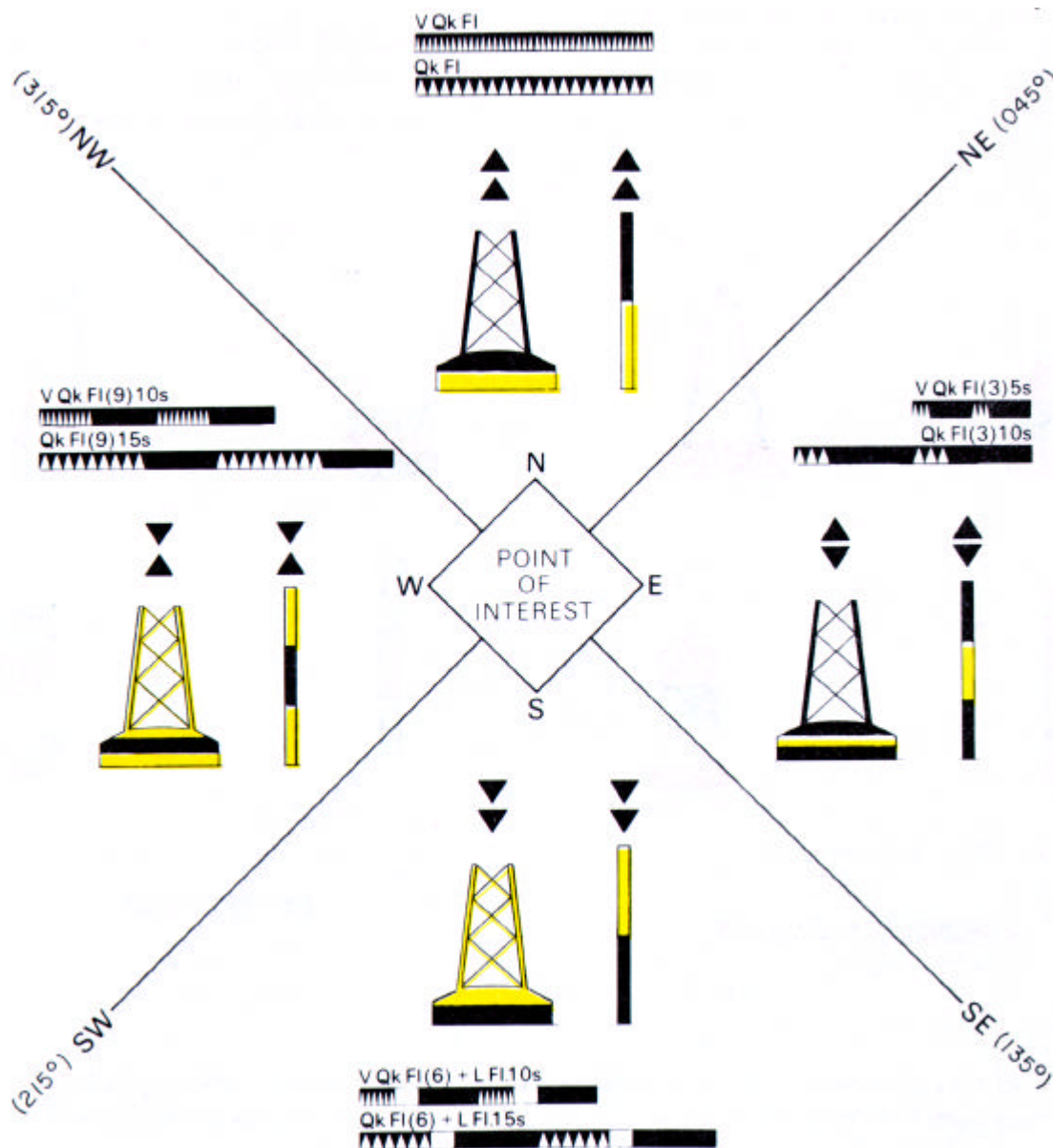


Figure 6-23.—IALA Maritime Buoyage System, cardinal marks.

The shape of a cardinal mark is not important, but in the case of a buoy, it will be a pillar or a spar.

Light Characteristics

When lighted, a cardinal mark exhibits a white light. The characteristics are based on a group of quick (Qk) or very quick (VQk) flashes. These flashes distinguish it as a cardinal mark and indicate its quadrant. The distinguishing QK or VQK flashes are as follows:

- North—uninterrupted
- East—three flashes in a group
- South—six flashes in a group followed by a long flash
- West—nine flashes in a group

As a memory aid, associate the number of flashes in each group with a clock face (3 o'clock—east, 6 o'clock—south, and 9 o'clock—west).

The long flash immediately following the group of flashes of a south cardinal mark is to ensure that its six flashes cannot be mistaken for three or nine.

Quick flashing lights flash at a rate of 50 to 79 flashes per minute. Very quick flashing lights flash at a rate of 80 to 159 flashes per minute. The two rates of flashing are used in situations that might cause confusion for mariners. For example, suppose two north buoys are placed near enough to each other that they might be mistaken for one another. In this case, one buoy would be set for quick flashing, while the other would be set for very quick flashing.

ISOLATED DANGER MARKS

An isolated danger mark (fig. 6-24) is erected on, or moored above, an isolated danger of limited extent. The isolated danger mark has navigable water all around it.



Figure 6-24.—IALA Maritime Buoyage System, isolated danger mark.

The extent of the surrounding navigable water is not important. The isolated danger mark can, for example, indicate either a shoal that is well offshore of an islet separated by a narrow channel from the coast.

A black double-sphere topmark is, by day, the most important feature of an isolated danger mark. Whenever practical, this topmark will be carried with the spheres as large as possible, mounted vertically, and clearly separated.

The isolated danger mark is painted black, with one or more red horizontal bands. Its shape is not significant, but if the mark is a buoy, it will be a pillar or spar.

If the danger mark is a spar buoy and is lighted, it will have a white flashing light showing a group of two flashes. The association of two flashes and two spheres in the topmark may be a help in remembering these characteristics.

SAFE WATER MARKS

A safe water mark (fig. 6-25) is used to indicate there is navigable water all around the mark. Such a

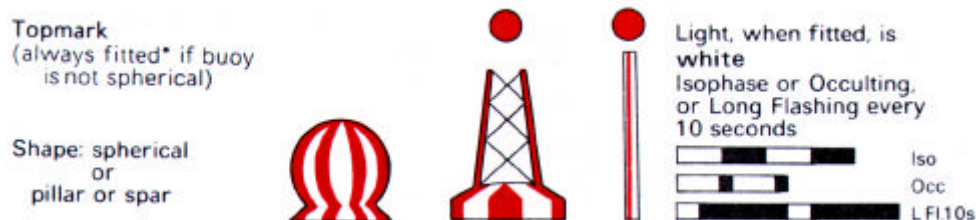


Figure 6-25.—IALA Maritime Buoyage System, safe water marks.

mark may be used as a center line buoy, a midchannel buoy, or a landfall buoy.

Red and white vertical stripes are used to indicate safe water marks. The vertical stripes distinguish them from the black-banded danger marks. Spherical, pillar, or spar buoys may be used as safe water marks. Whenever practical, a pillar or spar buoy used as a safe water mark will carry a single red sphere topmark.

When lighted, a safe water mark exhibits a white light. The phase characteristics of the light may be occulting, equal interval (isophase), one long flash every 10 seconds, or Morse “A.”

SPECIAL MARKS

A special mark (fig. 6-26) may be used to point out a special area or feature. You can find the nature of the special area or feature by consulting the chart, *Sailing Directions*, or *Notice to Mariners*. The uses of a special mark include the following:

- Ocean Data Acquisition System (ODAS) buoys carrying oceanographic or meteorological sensors
- Traffic separation marks
- Spoil ground marks
- Military exercise zone marks
- Cable or pipeline marks, including outfall pipes
- Recreation zone marks

Another function of a special mark is to define a channel within a channel (for example, a channel for

deep-draft vessels in a wide-approach area where the limits of the channel for normal navigation are marked by red and green lateral buoys).

Yellow is the color used for special marks. The shape of a special mark is optional, but it must not conflict with a lateral mark or a safe water mark. For example, an outfall buoy on the port side of a channel could be can-shaped but not conical.

When a topmark is carried, it takes the form of a single yellow X. When a light is exhibited, it is yellow. The phase characteristics may be any except those used for the white lights of cardinal, isolated danger, and safe water marks.

NEW DANGERS

A newly discovered hazard to navigation, not yet shown on charts or included in *Sailing Directions* or sufficiently announced by *Notice to Mariners*, is called a “new danger.” The term *new danger* covers naturally occurring obstructions, such as sandbanks or rocks, and man-made dangers, such as wrecks.

A new danger is marked by one or more cardinal or lateral marks following the IALA Maritime Buoyage System. When the danger is especially grave, it will be marked by marks that are identical until the danger has been sufficiently announced.

When a lighted mark is used for a new danger, it must exhibit a quick flashing or a very quick flashing light. When it is a cardinal mark, it must exhibit a white light. When it is a lateral mark, it must exhibit a red or green light.

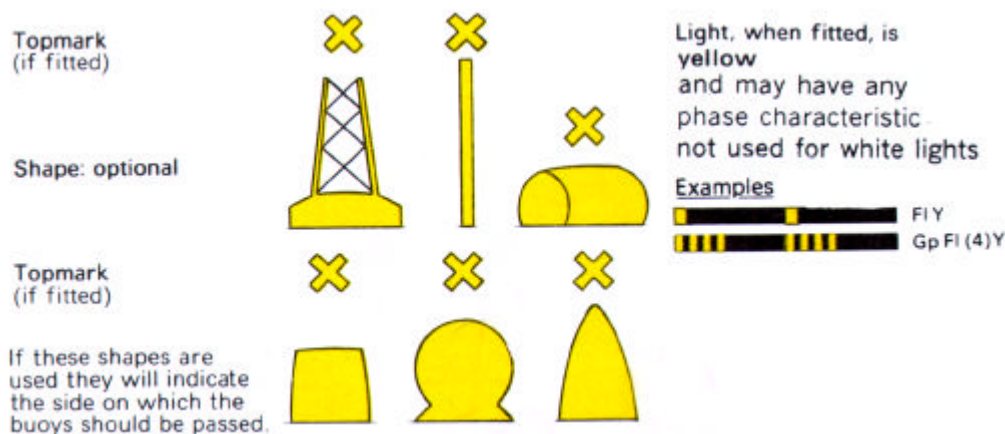


Figure 6-26.—IALA Maritime Buoyage System, special marks.

The duplicate mark may carry a radar beacon (RACON), coded D (-.), showing a signal length of 1 nautical mile on a radar display.

DAYMARKS

Unlighted aids to navigation (except unlighted buoys) are called daymarks (fig. 6-27). A daymark may consist of a single pile with a mark on top of it, a spar supporting a cask, a slate or masonry tower, or any of several structures.

Daymarks, like lighthouses and light structures, are usually colored, to distinguish them from their surroundings and make them easy to identify. Daymarks marking channels are colored and numbered like channel buoys. Many are fitted with reflectors that show the same colors a lighted buoy would show at night in the same position.

AIDS IN THE INTRACOASTAL WATERWAY

The Intracoastal Waterway, called the inland waterway, is a channel in which a light-draft vessel can navigate coastwise from the Chesapeake Bay almost to the Mexican border, remaining inside the natural or artificial breakwaters for almost the entire length of the trip.

Every buoy, daymark, or light structure along the Intracoastal Waterway has part of its surface painted yellow—the distinctive coloring adopted for this waterway. Somewhere on a lighted buoy is a band or a border of yellow.

Red buoys and daymarks are to the right, green to the left, as you proceed from the Chesapeake Bay toward Mexico. As in other channels, red buoys have even numbers; green buoys, odd numbers. Because the numbers would increase excessively in such a long line of buoys, they are numbered in groups that usually contain no more than 200 buoys. At certain natural dividing points, numbering begins again at one.

Lights on buoys in the Intracoastal Waterway follow the standard system of red lights on red buoys and green lights on green buoys. Lights on lighted aids besides buoys also agree with the standard rules for lights on aids to navigation.

DISTRESS SIGNALS

When a vessel or seaplane on the water is in distress and requires assistance from other vessels or from the

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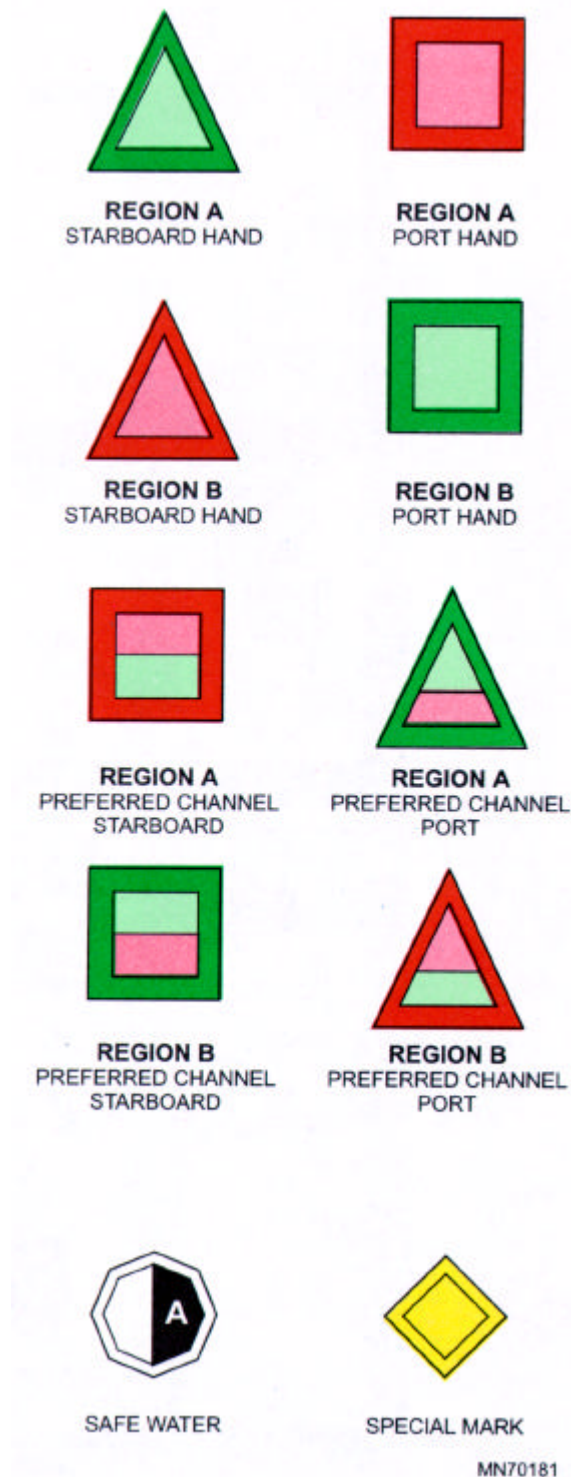
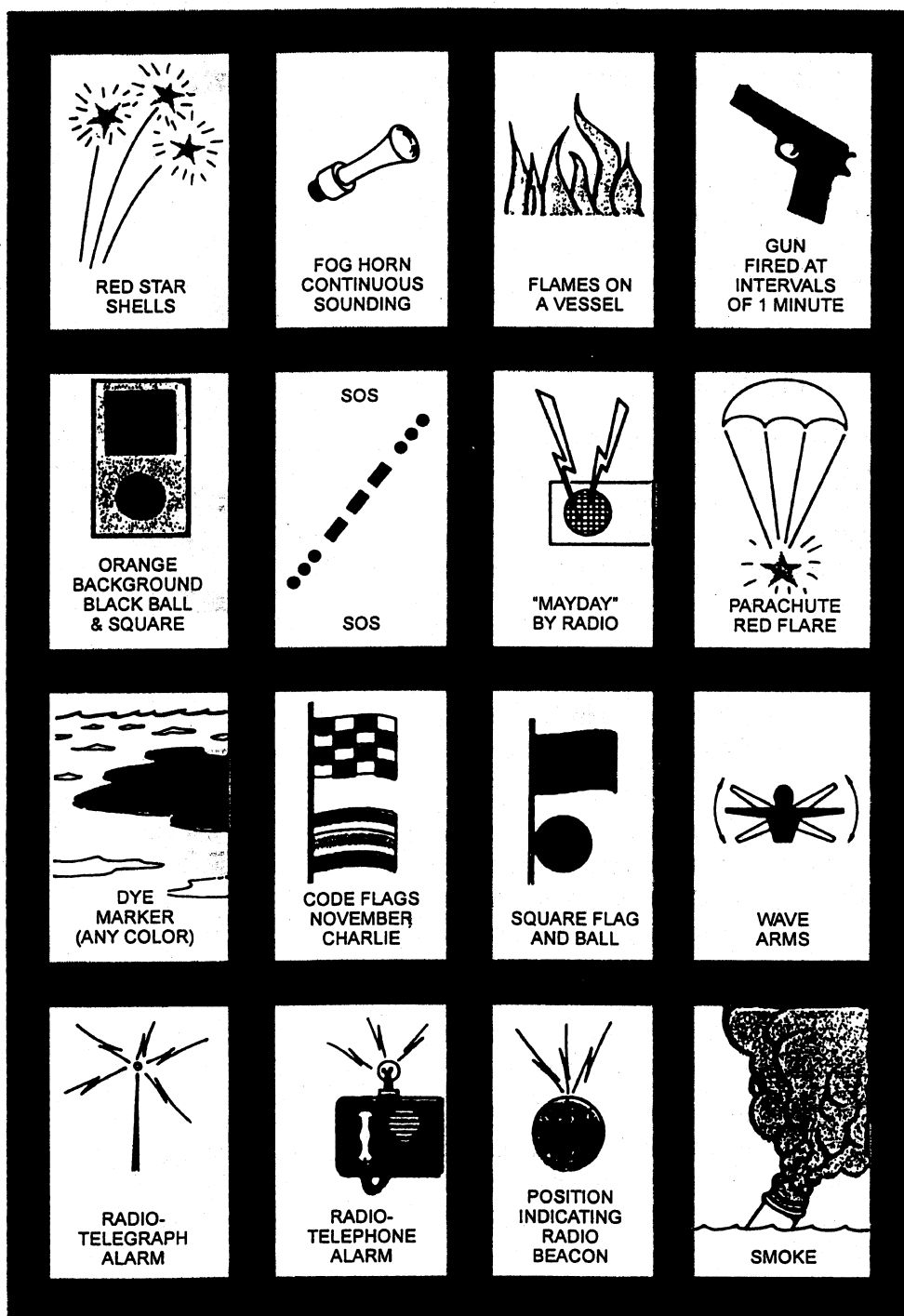


Figure 6-27.—IALA Maritime Buoyage System, lateral daymark

shore, it may use or display one or more international distress signals, either together or separately. The international distress signals are shown in figure 6-28 and are described below.

- A gun or other explosive signal fired at intervals of about 1 minute
- A continuous sounding with any fog signal apparatus



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Figure 6-28.—International/Inland distress signals.

- Rockets, or shells, throwing red stars, fired one at a time at short intervals
- A signal made by radiotelegraphy or by any other signaling methods, consisting of the group . . . - - - . . . (SOS in Morse code)
- A signal sent by radiotelephone consisting of the spoken word *Mayday*
- The International Code signal of distress indicated by NOVEMBER CHARLIE (flag hoist)
- A signal consisting of a square flag having above or below it a ball or anything resembling a ball
- Flames on the vessel (as from a burning tar barrel, oil barrel, and so on)
- A rocket parachute flare showing a red light
- A smoke signal giving off a volume of orange smoke
- Slowly and repeatedly raising and lowering arms outstretched to each side

